



Source Water Assessment Program (SWAP) Report For Berkshire School

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

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Table 1: Public Water System (PWS) Information

<i>PWS NAME</i>	Berkshire School
<i>PWS Address</i>	245 North Undermountain Road
<i>City/Town</i>	Sheffield, Massachusetts
<i>PWS ID Number</i>	1267001
<i>Local Contact</i>	Tim Fulco, Director of Physical Plant
<i>Phone Number</i>	413-229-1337

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #2	1267001-02G	352	1464	High
Well #3	1267001-03G	360	1600	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The Berkshire School is a private boarding school for grades 9-12, located in the rural community of Sheffield served by on-site water supply and septic disposal. Sources 01G and 01S are physically disconnected from the system, designated as emergency sources and therefore, not addressed in this report. Well 02G is a 255-foot deep, 6-inch diameter well, with 88 feet of casing. The Department approved well 02G in August 1991, allowing for the asphalt tennis court within the Zone I with the stipulation that no activities would be added or expanded within the Zone I. The approved safe yield of this source is 34.5 gallons per minute with a maximum daily withdrawal of 49,700 gallons. The Zone I and Interim Wellhead Protection Area (IWPA) radii are 352 feet and 1464 feet, respectively. The Zone I is the protected area immediately surrounding the wellhead while the IWPA provides an interim protection area for a water supply well

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA.

The final construction and approval of Well 03G has recently been completed. This 8-inch diameter, 700-foot deep bedrock well was approved by the Department through the New Source Approval Process for a total maximum daily withdrawal rate of 54,000 gallons per day, or 37.5 gallons per minute. This source has a Zone I radius of 360 feet and an IWPA radius of 1600 feet.

USGS maps the bedrock within the area as quartz-mica schist. The overburden is a relatively thin layer of till. There is no record of a confining, protective clay layer in the vicinity of the well. Wells located in these geological conditions are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface.

The well serving the facility has no treatment at this time. For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Please refer to the attached map of the Zone I and IWPA and Table 1 for additional information regarding the location of the well and activities within the protection areas.

2. Discussion of Land Uses in the Protection Areas

There are few activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Underground Storage Tanks;**
2. **Above-ground Storage Tanks;**
3. **Floor Drains in Boiler Rooms; and**
4. **Septic System.**

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
School	No	Both wells	Moderate	School facilities with in IWPA
Septic System	No	Both wells	Moderate	See Septic System Brochure
Underground Storage Tanks	No	Both wells	High	Multiple tanks, mostly new with alarm systems; monitor for leaks, overfills
Above-Ground Storage Tanks	No	Both wells	Moderate	Multiple tanks; monitor for leaks, cracks, overfills
Floor Drains in Boiler Rooms	No	Both wells	Moderate	See UIC brochure
Parking lots, Internal Transportation Corridors	No	Both wells	Moderate	Limit road salt usage and provide drainage away from wells
Catch basins	No	Both wells	Low	Non-water supply structures in Zone I
Passive Recreation (Tennis Courts)	Well #2	Both wells	Low	Approved within Zone I at time of well approval; prohibit pesticide/herbicide use

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

The overall ranking of susceptibility to contamination for wells 2 and 3 is high, based on the presence of one or more high ranking land use or activity in the Zone I and IWPA, as seen in Table 2.

1. Underground Storage Tank (UST) – There are five USTs located within IWPA, with a capacity of 10,000 gallons of fuel oil each. All tanks except one have been replaced and are now double-walled with alarm monitoring. Well #3 is topographically approximately 800 to 850 feet upgradient from the nearest UST or AST. Well #2 is approximately 450 feet, topographically upgradient of the tanks.

Recommendation:

- ✓ USTs in close proximity to the water supply should be closely monitored especially during deliveries. Any upgrades and modification must meet current construction standards and be done consistent with Massachusetts’s plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding USTs.

2. Above-ground Storage Tanks (ASTs) -- There are nine ASTs containing heating oil and propane located throughout the IWPA of both wells. If managed improperly, ASTs can be a potential source of contamination due to leaks or spills of the chemicals they store.

Recommendations:

- ✓ Aboveground storage tanks in your IWPA should be located on an impermeable surface and contained in an area large enough to hold 110% of the liquid volume, should a spill occur.
- ✓ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices. Any modifications to the AST must be accomplished in a manner consistent with Massachusetts’s plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs.

3. Floor Drains in Boiler Rooms -- A floor drain is located in the boiler room, which discharges into the septic system. Title 5 prohibits disposal of any wastewater other than sanitary waste to a septic system. The floor drain must be sealed, connected to a tight tank or as a last resort, protected to guarantee that boiler blow down, oil or other prohibited discharges cannot enter the floor drain.

Recommendations:

- ✓ Bring the floor drains into compliance with Department Regulations (refer to Industrial Floor Drain Brochure attached). Contact the UIC program for the Western Region Office of the Department (Rick Larson 413-755-2207 or Tony Zaharias 413-755-2122) for assistance.
- ✓ Interim Actions: cease using the floor drains.
- ✓ If you wish to retain the drain, install a tight tank and connect the boiler room floor drains to the tank.
- ✓ Require a policy and plan for maintenance operations, especially when oil filters are changed. We recommend that you require your boiler maintenance contractor to use containment and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should be responsible for the off-site disposal of any boiler blow down generated during maintenance.

4. Septic System – The facility is served by a 40, 000-gallon septic tank and a 30,000-gallon septic tank. Although the septic system and leach field for the facility are located outside of the Zone I and are topographically down gradient from the well, they are within the IWPA of the well. The most significant threats from a septic system are from lack of maintenance and improper disposal of non-sanitary waste. The school is currently evaluating how laboratory wastes are treated and disposed; a tight tank will be installed if required.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

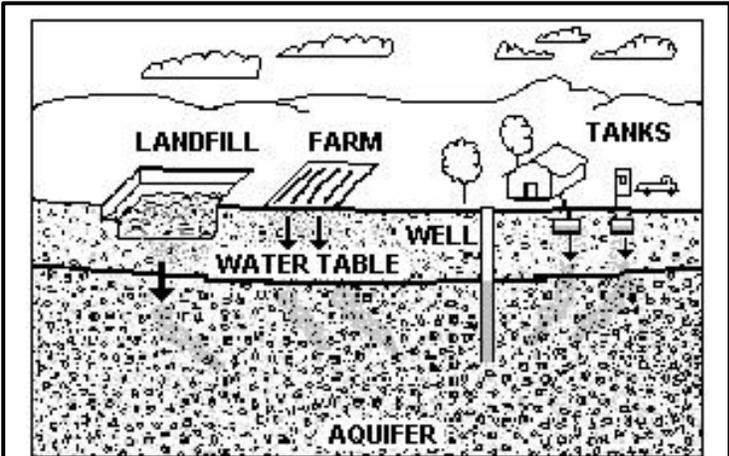


Figure 1: Example of how a well could become contaminated by different land uses and activities.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

For More Information:

Contact Catherine Skiba in DEP's Western Region Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/ including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier, town boards, and the local media.

Recommendations:

- ✓ Install a tight tank for science laboratory wastes as soon as possible.
- ✓ Provide staff and area residents with information about proper maintenance and disposal practices for septic systems. Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.
- ✓ Upgrade and maintain the facility's system as required.
- ✓ Avoid septic tank cleaners, especially those with acids and solvents.
- ✓ Eliminate all non-sanitary waste disposal from the septic system.

Other potential threats to the wells within the IWPA's noted during our visit were parking lots, internal transportation corridors, and catch basins. Vehicles parking within the protective areas pose a risk of release of petroleum products to the aquifer from leaks, accidents or road maintenance. Use minimal road salts and deicers within the protective areas, and monitor the parking lot and roadside for spills and leaks.

Catch basins transport storm water from the roadway and adjacent properties to the ground. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential contaminants include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents. Direct stormwater drain outflows away from the Zone I and IWPA. Work with the Town to have the catch basins inspected, maintained, and cleaned on a regular schedule. Additionally, street and parking lot sweeping reduces the amount of potential contaminants in storm runoff.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Berkshire School is commended for replacing underground fuel oil storage tanks and electrical transformers, and for evaluating the need for a tight tank on the chemistry lab drains. Berkshire School should review and adopt the key recommendations above and the following:

Priority Recommendations:

- ✓ Address floor drain issues.
- ✓ Install a sanitary cap on the emergency wellhead.
- ✓ Comply with the wastewater disposal requirements.

Zone I:

- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ Prohibit public access to the well and pumphouse by locking facilities, gating access roads, and posting signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check any above ground tanks for leaks, etc.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Upgrade to propane or natural gas for back-up power sources.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Incorporate groundwater education into school curriculum (K-6 and 7-12 curricula available; contact DEP for copies).
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Berkshire School is a registered Small Quantity Generator of Hazardous Waste. Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, refer to <http://www.state.ma.us/dep/bwp/dhm/files/sqgsum.pdf> for the Requirements for Small Quantity Generators.
- ✓ Eliminate non-sanitary wastewater discharges to on-site septic systems. Instead, in areas using hazardous materials such as science labs, discharge drains to a tight tank or sanitary sewer.
- ✓ Bring the floor drain into compliance with DEP Regulations (refer to attachment "Industrial Floor Drain Brochure").
- ✓ Floor drains in areas where hazardous materials or wastes might reach them need to drain to a tight tank, be sealed, or be connected to a sanitary sewer.
- ✓ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ Concrete pads should slope away from well and well casing should extend above ground.

Planning:

- ✓ Work with local officials in Sheffield to include the Berkshire School's IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). On or about May 1 the new RFR is available and the application is due back on or about June 31. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Pesticide Use Fact Sheet
- Industrial Floor Drains Brochure
- Healthy Schools Fact Sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form